UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,597	05/24/2002	Wolfgang Dultz	2345/159	5232

26646   7590   10/28/2009
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EXAMINER
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ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
10/28/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *16 October 2009*.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *13 and 16-35* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) *13,16-32,34 and 35* is/are rejected.
7) ☒ Claim(s) *33* is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some *   c) ☐ None of:
        1. ☐ Certified copies of the priority documents have been received.
        2. ☐ Certified copies of the priority documents have been received in Application No. _____.
        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This Office Action is responsive to the RCE filed on 10/16/2009.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 13, 17, 18, 20, 25-31, 34 and 35 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Haas et al (US Patent No. 5,311,346) in view of Robinson et al

(US Patent No. 6,404,520) **OR** Cao (US Patent No. 6,130,766).

Regarding claims 13, 17 and 27, referring to Figures 1 and 2, Haas discloses a

method for reducing distortion of an optical pulse contained in a communication-

transmitting luminous flux in an optical communication system caused by polarization

mode dispersion, comprising:

driving a polarization-controlling device to adjust a polarization of the optical

pulse so that a transmission quality of the optical communication system is maximized,

wherein the driving of the polarization-controlling device functions in response to the

transmission quality detected (As indicated in Fig. 1, a control circuit 30 driving a

polarization controlling device 32 response to the transmission quality detected, col. 3,

lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67); and

using a coupled-out portion of the communication transmitting luminous flux to

determine the transmission quality of the optical communication system, wherein the

polarization of the optical pulse is reset in predefined time intervals for optimizing

communication (As indicated in Fig. 1, the photo-detector 18 detects the optical output

signal to determine the transmission quality of the optical communication system, col. 3,

lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67).

Haas differs from claims 13, 17 and 27 in that he fails to specifically teach using

a small, coupled-out portion of the communication-transmitting luminous flux to

determine the transmission quality of the optical communication system. Robinson et al,

from the same field of endeavor, likewise teaches a polarization mode dispersion

compensator (Figure 3). Robinson et al further teaches using a small, coupled-out

portion of the communication-transmitting luminous flux to determine the transmission

quality of the optical communication system (As in Figure 3, Robinson et al teaches a

small, coupled out portion of the communication transmitting luminous flux is tapped by

an optical tap 37 and providing the tapped signal to a signal-to-noise-ratio meter 36 to

determine the transmission quality of the optical communication system, and the signal-

to-noise-ratio meter 36 provides the signal to noise ratio information SNR to the

controller 22 for controlling the polarization mode dispersion compensator PMDC 32,

col. 5, lines 5-32). **OR** Cao, from the same field of endeavor, likewise teaches an

polarization mode dispersion compensator (Figures 1 and 2). Cao further teaches using

a small, coupled-out portion of the communication-transmitting luminous flux to

determine the transmission quality of the optical communication system (As indicated in

Fig. 1, using a small, coupled out portion of the communication transmitting luminous

flux from an optical beam splitter 24 to determine the transmission quality of the optical

communication system by a DSP control unit 30 and providing the control signal to the

driver 28 for controlling the polarization controller 22, col. 4, lines 64-67, col. 5, lines 1-

67 and col. 6, lines 1-54). Based on this teaching, it would have been obvious to one

having skill in the art at the time the invention was made to incorporate the using a

small, coupled-out portion of the communication-transmitting luminous flux to determine

the transmission quality of the optical communication system as taught by Robinson et

al **OR** Cao in the system of Haas. One of ordinary skill in the art would have been

motivated to do this since allowing compensating the polarization mode dispersion of

the optical signal and to reduce the distortion of the optical signal and improving the

quality of the received signal.

Regarding claims 18, 29 and 31, the combination of Hass and Robinson et al OR

Cao teaches wherein the polarization of the optical pulse is controlled at an input end of

the optical communication system (i.e., Fig. 1 of Hass, col. 3, lines 32-67, col. 4, lines 1-

49, and col. 6, lines 32-49 and lines 61-67, and Fig. 1 of Cao, col. 4, lines 64-67, col. 5,

lines 1-67 and col. 6, lines 1-54).

Regarding claims 20 and 30, the combination of Hass and Robinson et al OR

Cao teaches the polarization-controlling device includes a first $\lambda/4$ delay element, a $\lambda/2$

delay element and a second $\lambda/4$ delay element, the first $\lambda/4$, $\lambda/2$ and second $\lambda/4$ delay

elements being disposed in series as $\lambda/4$-$\lambda/2$-$\lambda/4$ and being adjustable (i.e., Fig. 1 of

Haas, col. 3, lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67, and

Fig. 1 of Cao, col. 4, lines 64-67, col. 5, lines 1-67 and col. 6, lines 1-54).

Regarding claims 25 and 28, the combination of Hass and Robinson et al OR

Cao teaches resetting the polarization of the optical pulse in predefined time intervals

for optimizing communication (i.e., Fig. 1 of Hass, col. 3, lines 32-67, col. 4, lines 1-49,

and col. 6, lines 32-49 and lines 61-67, and Fig. 1 of Cao, col. 4, lines 64-67, col. 5,

lines 1-67 and col. 6, lines 1-54).

Regarding claims 26 and 34, the combination of Hass and Robinson et al OR

Cao teaches the polarization-controlling device includes a first $\lambda/4$ delay element, a $\lambda/2$

delay element and a second $\lambda/4$ delay element, the first $\lambda/4$, $\lambda/2$ and second $\lambda/4$ delay

elements being disposed in series as $\lambda/4$-$\lambda/2$-$\lambda/4$ and being adjustable (i.e., Fig. 1 of

Haas, col. 3, lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67, and

Fig. 1 of Cao, col. 4, lines 64-67, col. 5, lines 1-67 and col. 6, lines 1-54).

Regarding claim 35, the combination of Hass and Robinson et al OR Cao

teaches wherein the predefined time intervals are set to zero (i.e., Fig. 1 of Haas, col. 3,

lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67, and Fig. 1 of Cao,

col. 4, lines 64-67, col. 5, lines 1-67 and col. 6, lines 1-54).

4.   Claims 16, 19, 21-24 and 32 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Haas et al (US Patent No. 5,311,346) in view of Robinson et al (US

Patent No. 6,404,520) **OR** Cao (US Patent No. 6,130,766) further in view of Sakakibara

et al (US Patent No. 5,596,441).

Regarding claims 16, 19, 21 and 32, the combination of Hass and Robinson et al OR OR Cao differs from claims 16, 19, 21 and 32 in that it fails to teach an analyzer is a linear polarizer. However, Sakakibara et al teaches an analyzer is a linear polarizer (i.e., As indicated in Fig. 1, Sakakibara et al teaches a linear polarizer 1 and see col. 3, lines 5-67 and col. 4, lines 1-54). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the analyzer is a linear polarizer as taught by Sakakibara et al in the system of the combination of Haas and Robinson et al **OR** Cao. One of ordinary skill in the art would have been motivated to do this since allowing compensating the dispersion of the signal and to reduce the distortion of the signal and improving the quality of the signal.

Regarding claims 22 and 23, the combination of Hass, Robinson et al OR Cao and Sakakibara et al teaches wherein at least one delay element includes a liquid crystal element or an electro-optical crystal (i.e., Fig. 1 of Haas, col. 3, lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67, and Fig. 1 of Cao, col. 4, lines 64-67, col. 5, lines 1-67 and col. 6, lines 1-54).

Regarding claim 24, the combination of Hass, Robinson et al OR Cao and Sakakibara et al teaches at least one delay element includes at least one of a mechanically adjustable element, an electromotively adjustable element and a piezoelectrically adjustable element of three fiber loops (i.e., Fig. 1 of Haas, col. 3, lines 32-67, col. 4, lines 1-49, and col. 6, lines 32-49 and lines 61-67, and Fig. 1 of Cao, col. 4, lines 64-67, col. 5, lines 1-67 and col. 6, lines 1-54).

Allowable Subject Matter

5.   Claim 33 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6.   Applicant's arguments filed 10/16/2009 have been fully considered but they are not persuasive.

The applicant's arguments to claims 13 and 16-26 are not persuasive. The independent claims 13 and 17 include the limitation of "**using a small, coupled-out portion of the communication-transmitting luminous flux to determine the transmission quality of the optical communication system**" and the applicant argues that the cited references (Hass et al, Robinson et al and Cao) fail to teach such limitation. The examiner respectfully disagrees. As in Figure 3, Robinson et al teaches a small, coupled out portion of the communication transmitting luminous flux is tapped by an optical tap 37 and providing the tapped signal to a signal-to-noise-ratio meter 36 to determine the transmission quality of the optical communication system, and the signal-to-noise-ratio meter 36 provides the signal to noise ratio information SNR to the controller 22 for controlling the polarization mode dispersion compensator PMDC 32 (i.e., Fig. 3, col. 5, lines 5-32). **OR** Cao, in Fig. 1, teaches using a small, coupled out portion of the communication transmitting luminous flux from an optical beam splitter 24 and providing this tapped signal to a DSP control unit 30 to determine the transmission

quality of the optical communication system and the DSP control unit 30 provides a

control signal to the driver 28 for controlling the polarization controller 22 (i.e., Fig. 1,

col. 4, lines 64-67, col. 5, lines 1-67 and col. 6, lines 1-54).

Therefore, it is believed that the limitations of claims 13 and 16-26 are still met

by the combination of Haas and Robinson et al **OR** Cao and Sakakibara et al, and the

rejection is still maintained.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Hakki (US Patent No. 5,659,412) discloses method and apparatus for

compensating dispersion of polarization.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kenneth Vanderpuye, can be reached on (571)272-3078. The fax phone

number for the organization where this application or proceeding is assigned is

(571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

/Hanh Phan/

Primary Examiner, Art Unit 2613